Amendments to the Specification and Abstract

Please replace paragraph [0002] with the following:

[0002] (amended) In the prior art, light emitting diodes ~~("LED"s")~~ ("LED's") and other semiconductor light sources were traditionally used for panel displays (such as laptop computer screens), signal lighting, and other instrumentation purposes. ~~("LED"s")~~ ("LED's") are desirable because they are a high efficiency light source that uses substantially less energy and creates less heat than typical prior art light sources such as incandescent and halogen lights. Prior art semiconductor light sources have not been successfully and economically used to illuminate physical spaces. Additionally, in the prior art, ~~("LED"s")~~ ("LED's") were typically individually packaged in a module, either with or without a focus dome on the module. Typical prior art LED modules lack high light intensity due to the size of the LED chips used. Further, arranging a sufficient number of prior art LED modules to generate high light intensity, such as use of a stack, lamp or array, took an excessive amount of physical space and created unmanageable amounts of heat. Consequently, in the prior art, LED's and other semiconductor light sources were not suitable for replacing the traditional tungsten light bulbs.

Please replace paragraph [0007] with the following:

[0007] (amended) It is an object of some embodiments of the invention to provide a semiconductor light source capable of illuminating a space with visible light. ~~Thes~~ These and other objects of various embodiments of the invention will become apparent to persons of ordinary skill in the art upon reading the specification, viewing the appended drawings, and reading the claims.

Please replace paragraph [0010] with the following:

[0010] (amended) Figure 3a depicts ~~an~~ a LED with an insulating substrate.

Please replace paragraph [0011] with the following:

[0011] (amended) Figure 3b depicts a detailed view of ~~an~~ <u>a</u> LED structure on a sapphire substrate.

Please replace paragraph [0012] with the following:

[0012] (amended) Figure 3c depicts ~~an~~ <u>a</u> LED with a conducting substrate.

Please replace paragraph [0013] with the following:

[0013] (amended) Figure 3d depicts a detailed view of ~~an~~ <u>a</u> LED structure on a sapphire substrate.

Please replace paragraph [0018] with the following:

[0018] (amended) Figure 4a depicts a top view of ~~an~~ <u>a</u> LED array on a single chip with an insulating substrate.

Please replace paragraph [0019] with the following:

[0019] (amended) Figure 4b depicts a top view of ~~an~~ <u>a</u> LED array on a single chip with a conductive substrate.

Please replace paragraph [0030] with the following:

[0030] (amended) Figure 10 depicts ~~an~~ <u>a</u> LED or laser light source located in a light enclosure having a phosphor coating.

Please replace paragraph [0038] with the following:

[0038] (amended) Mounted on the heat sink 104 are at least one semiconductor device 106. The semiconductor device(s) 106 may be arranged in this embodiment of the invention to transmit light in all directions except through the base 103, or in a manner to direct light in a specific direction. The semiconductor devices may be any semiconductor devices capable of emitting light, such as LED's, LED arrays, ~~VCSEL"s~~ VCSEL's, VCSEL arrays, photon recycling devices that cause a monochromatic chip to emit white light, and others.

Please replace paragraph [0047] with the following:

[0047] (amended) Figure 3b depicts an example of epitaxial layer configuration for the LED of Figure 3a. A light emitting diode on an electrically insulative substrate 1200 is depicted. The LED includes an electrically insulative substrate such as sapphire 1201. The substrate serves as a carrier, pad or platform on which to grow the ~~chip"s~~ chip's epitaxial layers. The first layer placed on the substrate 1201 is a buffer layer 1202, in this case a GaN buffer layer. Use of a buffer layer reduces defects in the chip which would otherwise arise due to differences in material properties between the epitaxial layers and the substrate. Then a conductive layer 1203 is provided, such as n-GaN. This layer acts as a connector for a negative electrode. Then a cladding layer 1204, such as n-AlGaN, is provided. Cladding layers serve to confine the electrons as they jump from a conduction band to valance and give up energy that converts to light. An active layer 1205 p-InGaN is then provided where electrons jump from a conduction band to valance and emit energy which converts to light. On the active layer 1205, another cladding layer 1206, such as p-AlGaN is provided that also serves to confine electrons. A contact layer 1207 such as p+ - GaN is provided that is doped for Ohmic contact. The contact layer 1207 has a positive electrode 1208 mounted on it, in this case an electrode that has a mount side on the contact layer 1207 that is Ni and an electrode face that is Au. A similar negative electrode is provide on a shelf of the first cladding layer 1203.

Please replace paragraph [0051] with the following:

[0051] (amended) Figure 3f depicts epitaxial layer configuration of the VCSEL chip of Figure 3e

with an electrically insulative substrate 1220. The chip 1220 includes a substrate 1221 that has electrically insulative properties such as sapphire. On top of the substrate 1221 there is a buffer layer 1222 such as GaN followed by a cladding layer and contact layer 1223 such as n-GaN. The cladding layer 1223 includes a negative electrode 1232c. Next, there is another cladding layer nGaInN 1224. A reflective layer AlN/AlGaN MQW (multiple quantum wells) 1225 is provided. A cladding layer 1226 n-AlGaN is interposed between the reflective layer 1225 and the active layer 1227 GaInN MQW. The active layer 1227 is followed by another cladding layer p-AlGaN 1228 which is followed by a second reflective layer 1229 AlN/AlGaN MQW. Light emitted from the active layer reflects between the two reflective layers until it reaches an appropriate energy level and then lases, emitting a laser beam of light. The second reflective layer 1229 is followed by a cladding layer ~~p-AlGaN 1230~~ <u>p – AlGaN 1230</u> and a contact layer p+ - GaN 1231. The contact layer may be ring-shaped with a window opening 1233 and has one or more positive electrodes 1232a and 1232b which are contact areas. The negative electrode is created on the n-GaN layer.

Please replace paragraph [0053] with the following:

[0053] (amended) Figure 3h depicts epitaxial layer configuration of a VCSEL chip with an electrically conductive substrate 1239 such as that of Figure 3g. The chip 1239 includes a substrate 1241 that has electrically conductive properties such as SiC. The underside of the substrate 1241 has an electrode 1240. On top of the substrate 1241 there is a buffer layer 1242 such as GaN followed by a cladding layer 1243 such as n-GaN. Next, there is another cladding layer NGaInN 1244. A reflective layer using AlN/AlGaN MQW (multiple quantum wells) 1245 is then provided. A cladding layer 1246 n-AlGaN is interposed between the first reflective layer 1245 and the active layer 1247 GaInN MQW. The active layer 1247 is followed by another cladding layer p-AlGaN 1248 which is followed by a second reflective layer 1429 AlN/AlGaN MQW. The second reflective layer 1249 is followed by a cladding layer ~~p-AlGaN 1250~~ <u>p – AlGaN 1250</u> and a contact layer p+ - GaN 1251. The contact layer may have one or more positive electrodes 1252a and 1252b mounted on it.

Please replace paragraph [0062] with the following:

[0062] (amended) Figure 8a depicts a chip package with phosphor covering 601. The package includes a heat sink 602 in which a well is located 603 for receiving a chip or array 604. Connection blocks 605a and 605b and lead wires 606a and 606b may be used to electrically power the chip or array 604. A thickness of phosphor 607 may be placed over the chip or array 604 in order to convert single wavelength light emitted from the chip or array into multiple wavelength white light useful for illumination of spaces used by humans. ~~Figure 8 b~~ Figure 8b depicts another phosphor coated chip package 6000. It includes a heat sink 6001 on which a light emitting chip 6002 is mounted in a receptacle 6005 on the heat sink. The chip 6002 does not fill the entirety of the receptacle 6005 so a transparent filler 6003 of a material transparent to the wavelength of light emitted by the chip 6002 is provided. Some transparent materials which may be used include epoxy, plastic and others. On the face of the chip 6002 opposite the heat sink 6001 a wavelength conversion coating or layer 6004 is provided to convert the light emitted by the chip to white light. A phosphor coating is preferred.

Please replace paragraph [0074] with the following:

[0074] (amended) A method for making a semiconductor light source for illuminating a physical space has been invented. In various embodiments of the invention, a semiconductor such as ~~and~~ a LED chip, laser chip, LED chip array, laser array, an array of chips, or a VCSEL chip is mounted on a heat sink. The heat sink may have multiple panels for mounting chips in various orientations. The chips may be mounted directly to a primary heat sink which is in turn mounted to a multi-panel secondary heat sink. A TE cooler and air circulation may be provided to enhance heat dissipation. An AC/DC converter may be included in the light source fitting.